

# CLAIMS

What is claimed is:

1. For a computer system interconnected to other computer systems on a network, a method comprising the computer-implemented steps of:
  - (a) Providing a means for defining a Document Definition File (DDF), which is identified by a unique name and is a hierarchically organized plurality of elements, each element comprising an element type, element value, and a list of child elements;
  - (b) Providing a means for processing requests from computer systems on the network, comprising the computer-implemented steps of:
    - i. accepting a request for data from client systems, said request to include the identity of a DDF, and plurality of parameters, said parameters each comprising a reference to an element in the DDF and data;
    - ii. copying said parameter data into said referenced element;
    - iii. visiting each element systematically, for each substituting referenced element components with the actual value contained in said referenced element component, then performing a specified operation defined by said element;
    - iv. transmitting the resulting data to the client;
  - (c) Whereby a client computer system sends a request to said computer system identifying the DDF and input parameters, and the computer system reads the identified DDF, applies input parameters to said DDF, performs operations on every element of said DDF, and returns the resulting data set to the requesting client.
2. The method of Claim 1, wherein the method further comprises the steps of providing the capability to define in a graphical tree-based visual environment the format, content, instructions for fetching and/or generating data elements, and parameters available to vary the data depending on specific needs of a requestor, or client. The resulting file is called a Data Definition File (DDF).
3. The method of claim 1 in which specified operations defined by elements in the DDF are Structured Query Language (SQL) statements with substitutable parameters in any clause of the SQL statement; the SQL is executed on a database management system that is specified in same or referenced element; the data returned as a result of the SQL

statement is formatted into new elements and incorporated into the DDF, available to be referenced by operations in same or other elements;

4. The method of claim 3 wherein said new elements themselves inherit any child elements of the original element; the inherited child elements may specify operations that reference any original or newly generated elements.
5. The method of claim 1 wherein the method further comprises the steps of providing a computer system (Server) to build a data file (DF) given a DDF or the identification of a DDF and a set of parameters used for replacement within the DDF; the Server copies the DDF into a coupled memory, performs parameter substitution throughout the document by replacing instances of defined parameters with corresponding actual parameters passed in by the client, executes dynamic data elements to replace such elements with dynamic data, then performs formatting according to a format selected by the requestor; the resulting file in memory is transferred to the requesting client system;
6. The method of claim 1 in wherein the method further comprises the steps of providing elements in the DDF include operations executed by ActiveX or other software programs external to the Server.
7. The method of claim 1 in wherein the method further comprises the steps of providing elements in the DDF are commands that can be executed on a computer system command line, such as that provided by an MS-DOS shell, Unix shell (e.g. csh, sh, ksh).
8. The method of claim 1 in wherein the method further comprises the steps of providing DDF parameters that are first defined by a reference to an element or element component, and corresponding value; references to the same element or element component throughout the DDF are replaced by the parameter's value prior to the execution of any operation.
9. The method of claim 1 in wherein the method further comprises the steps of providing attributes which control certain aspects of generation of data, such as removing an element entirely from the resulting hierarchy, effectively moving the element's children up the hierarchy one level, or excluding the processing of the element altogether, and providing the ability of the requestor to vary this behavior on each request for the same DDF.

10. The method of claim 1 in wherein the method further comprises the steps of providing XML or its variants or subsets to be used as the format for the DDF and/or the resulting data file.
11. The method of claim 1 in wherein the method further comprises the steps of providing SGML or its variants or subsets to be used as the format for the DDF and/or the resulting data file.
12. The method of claim 1 in wherein the method further comprises the steps of providing a DDF that is formally defined as a list of elements, where each said element is defined as containing the following: a) Type, a character string naming the type of the element b) Attribute List, containing zero or more associations between one character string as the name of the attribute, and another character string as the value of the attribute, c) text data with zero or more characters, d) a Style identifier, indicating precise formatting instructions for outputting this element to a data file, and e) zero or more children elements in a hierarchical relationship;
13. The method of claim 12 in wherein the method further comprises the steps of providing elements containing substitution parameters in any portion of it, in which case the resulting element is produced by performing the appropriate key/value substitution; said elements fall into two broad categories: dynamic and static. Dynamic elements are executable, and/or contain data that can be translated by the Server, including substitutable parameters and hierarchy modification commands; hierarchy modification commands include the ability of an element to collapse itself so that its children are moved up one position in the hierarchy, and the ability to create new elements in the hierarchy by reformatting its data or the data of its children; said element may be a dynamic element, in which case it must be executed in order to produce its data.
14. The method of claim 13 in wherein the method further comprises the steps of providing augmented display information so that a client may more easily display the information; said augmentation to include screen identifier; screen position; label name; field edit, format and validation commands such as a regular expression as used by the Unix "grep" command; and any other rendering information such that the DDF specifies completely both the data definition and screen rendering attributes; whereby a single computer

~~Handwritten signature~~

- ~~Q34A1~~